TME 1238
1" NON DESTRUCTIVE READ-OUT STORAGE TUBE

The TME 1238 is a low cost, single-ended, high resolution, non destructive read out storage tube capable of storing and reading-out information in the form of electrical signals. Continuous read-out can be achieved for a few minutes without degradation of the stored-information.

The tube features fast writing and erasing, high resolving power, large storage and integration capability and selective erasure possibility. When gradual erasure of the stored information is necessary, it is possible to erase during line or image retrace in order to obtain the desired decay.

These characteristics make it particularly suitable for numerous applications such as : slow scan T.V., data recording and storage, scan conversion, integration of low level video signals... In addition, the tube is specially designed for applications where precise write-read registration is required.

Owing to its structure and electronoptics similar to those of 1" Vidicon, the TME 1238 can use supplies, focusing and deflecting coils designed for this Vidicon type.

TYPICAL PERFORMANCES

Peak output current	0.2	µA
Writing time :		
writing over the whole target area	40	ms (1 T.V. frame)
writing of one target diameter	50	µs
Erasing time :		
erasing of the whole written image to residual less than 10%	40	ms (1 T.V. frame)
Storage time :		
several days without reading		
Reading time :		
for continuous read-out	5 to 10	mn
Decay :		
by line retrace erasure, adjustable	from 1s to 10	mn
Resolution :		
by orthogonal writing and reading at 50 % modulation	800	T.V. lines per diameter

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GENERAL CHARACTERISTICS

Electrical

Heater voltage	6.3 V
Heater current	0.6 A
Output capacitance	5 pF
Focusing method	electromagnetic
Deflecting method	electromagnetic

Mechanical

Base	JEDEC E8 - 11
Operating position	any
Weight, approx.	100 g
Dimensions	see drawing

TYPICAL OPERATING CONDITIONS

Voltages listed hereunder are typical values. They may have to be modified according to values given in the Operating Data Sheet accompanying each tube.

Heater voltage	6.3 ± 10 %	V
Heater current	0.6	A

	Erase mode	Write mode	Read mode	
Cathode voltage	0	0	0	V
Grid G1 (Wehnelt) voltage	0	to be adjusted	to be adjusted	
Cut-off voltage : − 50 V to − 100 V				
Grid G2 (accelerator) voltage	450	450	450	V
Grid G3 (erasing) voltage	normal fast			
	450 0 to −30	450	450	V
Grid G4 (focus) voltage	450	440	450	V
		to be adjusted		
Grid G5 (decelerator) voltage	650	650	650	V
Target voltage	15 to 30	200	3 to 10	V

PHYSICAL DESCRIPTION AND OPERATING PRINCIPLE

The main components of the tube are an electron gun and a storage target assembly.

The electron gun includes an additional erasing electrode which enables two erasing modes depending on low or high beam current.

The target is made of a storage backplate on which the storage dielectric is deposited.

A general cross-view of the tube is given on fig. 1 and magnified view of the target on fig. 2.

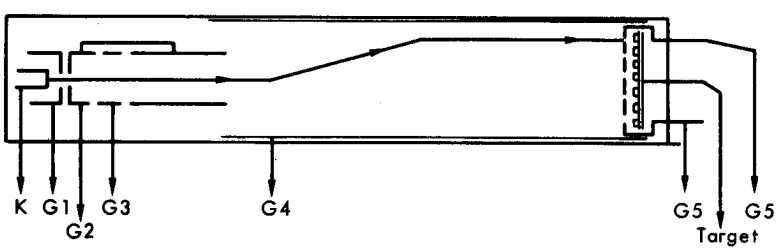

Figure 1

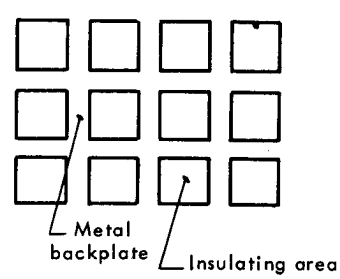

Figure 2

The principle of operation is the charge or discharge of the storage surface, according to the velocity of the primary electron beam through secondary emission of the storage surface.

Typical values (with respect to cathode) in erasing, writing and reading modes are given on fig. 3 as an example of operating conditions.

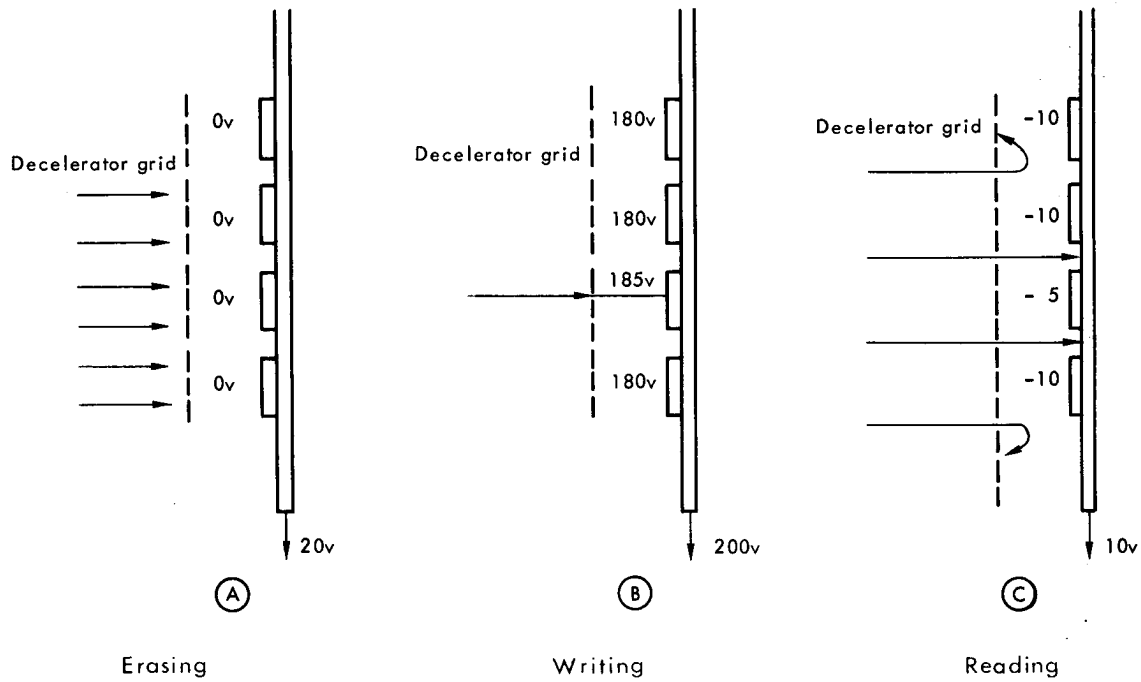

Figure 3

A - ERASE-PRIME

It is necessary to erase residual charges at the storage surface prior to writing. Erasure can be done by shifting the backplate voltage to 20 V. The capacitive coupling and the low energy electron beam cause the dielectric to be charged down to OV through secondary emission ratio less than 1.

B - WRITE

Storage backplate voltage is shifted to +200 V. Storage surface voltage is shifted to 180 V by capacitive coupling. When the electron beam modulated by the video input signal scans the storage surface, secondary emission ratio is then greater than 1 and positive charges are deposited on the dielectric areas, shifting their potential from 180 V to a few volts more positive values (185 V for example).

C - READ

Once the charge pattern has been written it can be read out by dropping the storage backplate voltage from 200 V to 10 V and by scanning it with an unmodulated beam. Depending on the written charge pattern the storage surface voltage varies within OV and − 10 V and signal output varies in exact correspondance. Since the storage surface voltages are negative with respect to gun cathode voltage, the reading beam has no adverse effect on the pattern and the read-out is non destructive. On the other hand, the most negative areas of the dielectric can completely cut off the electron beam while various gray shades can be obtained in areas where the dielectric is less negative.

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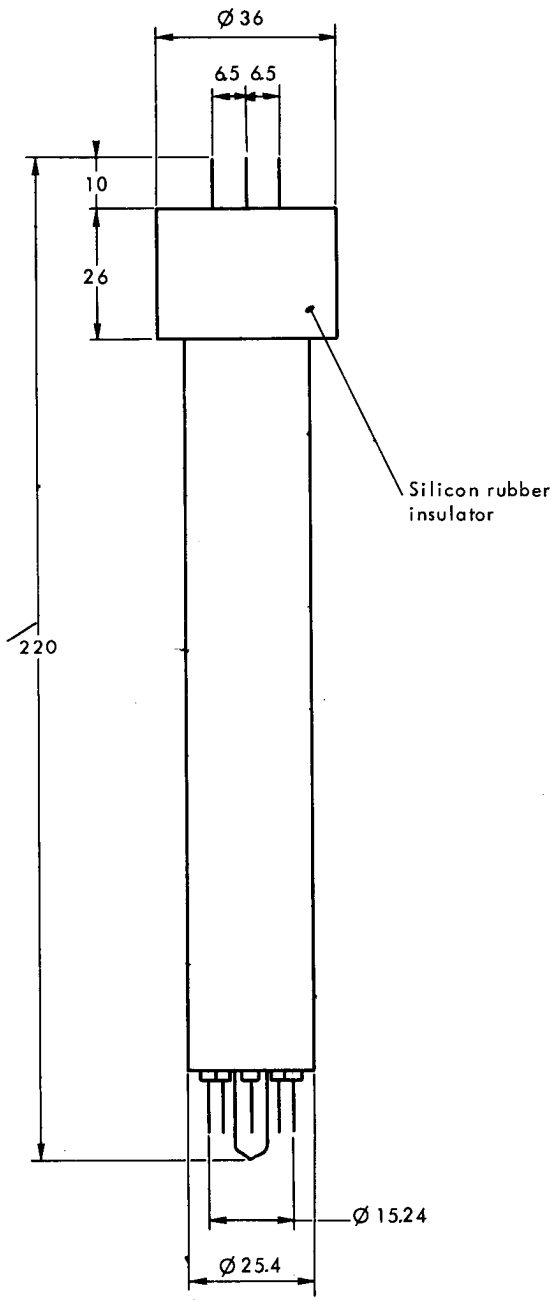
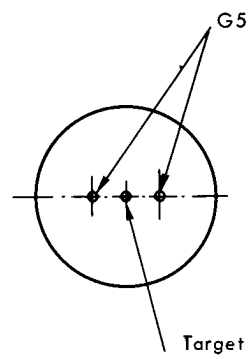
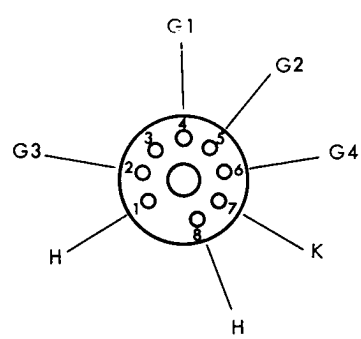
OUTLINE DRAWING





Base JEDEC E8-11



Dimensions in mm